

***Application for Patent***

***By***

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***For***

***Portable Shoulder Rehabilitation/Exerciser***

***Apparatus and Regimenn***

***Docket No. 4755***

TITLE OF THE INVENTION

Portable Shoulder Rehabilitation/Exerciser Apparatus and  
Regimenn

CROSS REFERENCE TO RELATED APPLICATION

This is a continuation of Provisional Application  
Serial No. 60/426178, by the same inventor under the same  
title, filed November 15, 2002.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to a portable  
shoulder rehabilitation regimenn/exerciser apparatus and  
more particularly to a portable shoulder  
rehabilitation/exerciser designed and configured for use by  
anyone needing to gain range of motion (ROM) of the shoulder  
and the invention is specifically designed and configured to

benefit individuals with hand disabilities such as arthritis including those individuals who are handicapped or elderly.

## 2. Description of the Prior Art

Shoulder exercisers are well known to the prior art. One such example is a portable exercise device as illustrated in U.S. Patent Number 5,556,369 issued to Roberts which discloses an exercise device for performing kinesthetic exercises from a plurality of fixable locations. This exercise device is adapted for connection to a doorframe, or secured about a door, or secured to a structural component of a building such as a wall or ceiling of a room, as well as within a confined space such as an alcove, hallway or room corner. Kinesthetesia is a class of exercise that is designed to improve agility, balance and coordination. The present invention, on the other hand, is directed to rehabilitation exercises for improving range of motion of the shoulder and is of particular use to patients with arthiritis.

Yet another example is seen in U.S. Patent Number 5,803,209 issued to Suzaki which discloses a motion restricting device restraining rectilinear movement of the

ends of a rope and comprised of a post with retainment rings passing the rope at one or both opposite ends of the post, and having at least one and preferably a plurality of radially projecting adjustment bits intermediate the ends of the post. This patent also discloses an exercise device securable to a fixed object or to an object controlled with respect to forces applied. Opposite end rings pass the length of the rope to which a pulling force is applied.

A further example is seen in U.S. Patent Number 6,261,212B1 issued to Vallone, et al, wherein disclosed is an adjustable resistance rehabilitation exercise device which includes a pilot pulley assembly and an adjustable resistance control spooler assembly. This device includes hand grips and a precision, spring style, straight scale for calibrating and verifying prescribed and preset exercise forces for individual therapeutic regimens.

A final example is seen in U.S. Patent Number 6,059,698 issued to Mazor wherein disclosed is an exercise device for removable mounting on a door and comprises a pair of U-shaped brackets that are mounted on the top and bottom edges of the door. Suspended between the brackets are a plurality of elastic cords of different elasticities. By selecting

different cords, different tensions or resistances can be obtained for exercise routines. An ankle strap may be used to exercise the leg muscles. In some versions, spacers may be provided between the U-shaped brackets and the door to prevent rocking.

As observed, all the previous inventions as described above have limitations in their ability to assist healthcare professionals in effectively treating stiff/painful shoulders that need to be forcefully, but at the individual patients' control, placed through a prescribed therapeutic exercise regimen. Thus it is seen that none of these previous efforts, however, provide the benefits intended with the kit of the present invention or method, such as providing a portable and adaptable shoulder rehabilitation kit to be used by the healthcare professional or the patient under a prescribed therapeutic exercise regimen. The following example illustrates the novel and unique application of the shoulder rehabilitator/exerciser component of the present invention. The shoulder rehabilitation/exerciser device provides for the ability of the patient to participate with one shoulder without supervision to follow prescribed therapeutic exercise regimens by utilizing a series of passive range of motion

exercises using the upper extremity. Additionally, prior techniques do not suggest the present inventive combination of component elements as disclosed and claimed herein. Accordingly, it is seen that there is a need for a portable and adaptable adjustable resistance rehabilitation shoulder exercise device designed and configured to offer the most advanced therapeutic exercise regimens available today to the medical community.

Thus, as will be seen, the present invention achieves its intended purposes, objectives and advantages over the prior art device through a new, useful and unobvious combination of component elements, which is simple to use, with the utilization of a minimum number of functioning parts, at a reasonable cost to manufacture, assemble, test and by employing only readily available material.

## SUMMARY OF THE INVENTION

The present invention is a novel and unique portable and adaptable shoulder/exerciser adjustable resistance device designed and configured to be used by a patient or individual without supervision with prescribed therapeutic exercise regimens as a component of a prescribed course of treatment. In addition, the portable and adaptable shoulder rehabilitation/exerciser program device of the present invention also provides enhanced upper extremities rehabilitation during the early strengthening phase of shoulder rehabilitation by improving patient range of motion of the shoulder through a series of passive range of motion exercises using the other upper extremity.

Utilizing the portable and adaptable shoulder rehabilitation/exerciser device of the present invention will innately enhance shoulder rehabilitation by providing the ability to gain range of motion of the shoulder. Thereby providing a means for quicker recovery, which will consequently result in lower cost to hospitals, insurers and the taxpayer.

An embodiment of the portable and adaptable shoulder rehabilitation/exerciser kit device of the present invention is comprised of a length of rope which passes through a pulley and a rope having a specifically designed and configured unique ball handle attached at each respective end of the rope. The pulley is removeably secured to the top of a conventional door via a hook or suspension device.

In order to provide for the novel benefits of the present invention, the shoulder rehabilitation/exerciser program kit of the present invention is designed and configured to provide for the patient or the user to be seated or standing during the therapeutic exercise regimenn. The novel and unique balls of the present invention are designed and configured to be positioned so that the ball used by the specific shoulder to be rehabilitated/exercised starts out at a lower position than the second ball in order to provide for the ability of the user to easily reach the first ball. Thus, the first hand of the shoulder to be rehabilitated/exercised is placed over the first ball (lower ball) with the fingers straddling the rope. The other hand (second hand) then reaches up and grasps the other ball (second ball) in a similar manner. Therefore, by pulling down on the other ball (second ball) with the normal or



active arm, the other rehabilitative/exercise arm is elevated passively. Thus, this adjustable resistance therapeutic rehabilitation/exercise regimenn provides for the ability of the patient or user to gain and restore range of motion of the shoulder while also importantly protecting the soft tissue and bony structure about the shoulder.

Accordingly, it is an object of the present invention to provide for a portable and adaptable shoulder rehabilitation/exerciser kit, designed and configured to be utilized by a healthcare professional or a patient under a prescribed therapeutic exercise regimenn, which will overcome the deficiencies, shortcomings, and drawbacks of prior shoulder exercise devices and methods thereof.

Another object of the present invention is to provide for a prescribed therapeutic rehabilitation exercise regimenn for flexion (forward elevation), abduction (out to the side), internal rotation or the like.

Still another object of the present invention is to provide for an exercise device that can be used by the normal, healthy individual and one that is versatile, aesthetically pleasing as well as user friendly.

Yet another object of the present invention is to provide for a portable and adaptable, adjustable resistance rehabilitation shoulder exercise device kit designed and configured to offer the most advanced therapeutic exercise regimens available today to the medical community.

Another object of the present invention, to be specifically enumerated herein, is to provide a portable and adaptable shoulder/exerciser adjustable resistance device to be used as a component for a prescribed course of treatment in accordance with the preceding objects and one which will conform to conventional forms of manufacture, be of simple construction and easy to use so as to provide a device that would be economically feasible, long lasting and relatively trouble free in operation.

Although there have been many shoulder exercise devices, some of which are listed above, none of these inventions achieve the intended purposes, objectives and advantages of the present invention. The present invention meets the requirements of the simplified design, compact size, low initial cost, low operating cost, ease of installation and maintainability, and one with a minimal

amount of training for a patient to successfully employ the invention.

The foregoing has outlined some of the more pertinent objects of the invention. These objects should be construed to be merely illustrative of some of the more prominent features and application of the intended invention. Many other beneficial results can be obtained by applying the disclosed invention in a different manner or modifying the invention within the scope of the disclosure. Accordingly, a fuller understanding of the invention may be had by referring to the detailed description of the preferred embodiments in addition to the scope of the invention defined by the description of embodiments taken in conjunction with the accompanying drawings.

## DESCRIPTION OF THE DRAWINGS

Similar reference numerals refer to similar parts throughout the several views of the drawings.

Figure 1 is an illustration of the portable and adaptable shoulder rehabilitation/exercise kit of the present invention in use by a patient.

Figure 2 illustrates details of the hook/suspension mechanism of the rehabilitation/exerciser kit of the present invention.

Figure 3 illustrates the hook, pulley and rope components of the rehabilitation/exerciser kit of the present invention.

Figure 4 illustrates a cross-section of the unique ball handles and the rope which passes completely through the ball handles of the rehabilitation/exerciser kit of the present invention.

Figs. 1-4 illustrate various preferred configurations of the present invention.

## DESCRIPTION OF THE EMBODIMENTS

The present invention provides for a portable and adaptable shoulder rehabilitation/exerciser apparatus designed and configured for use by anyone needing to gain range of motion of the shoulder, and is specifically designed and configured to be used under a prescribed therapeutic exercise regimen. The apparatus 10 of the present invention, as seen in Figures 1-4, is comprised of a length of rope 12 that passes through a pulley 14 and provides for a novel and unique ball handle 16 at either end of the rope. In one embodiment, the rope 12 is secured to the ball handle 16 by drilling a path through a diameter of the ball handle 16 and inserting the rope 12 through the drilled path until the rope 12 extends through the opposite side of the ball handle 16. The end of the rope 12 is then secured to an interference screw which then secures the rope 12 within the ball and prevents the rope from being pulled out of the ball handle 16. A wooden cap (not shown) may then be secured into the drilled path opening at the opposite side of the ball handle 16 and is permanently secured via glue or the like. In an alternate embodiment, the end of the rope 12, which has passed through the drilled path of the ball handle 16, may be permanently secured via a

knot or the like as shown in Figure 4. In yet another embodiment, the end of the rope 12, which has passed through the drilled path of the ball handle 16, may be permanently secured via a clamp, staple or the like. The pulley 14 is attached to a hook 18 or other suspension mechanism 18, which is placed over the top of a door 20 or the like. The shoulder rehabilitation/exerciser apparatus 10 is designed and configured to provide for a specific prescribed therapeutic rehabilitation/exerciser regimenn utilizing one shoulder through a series of passive range of motion exercises while also participating with the other upper extremity. Thus, the apparatus 10 of the present invention and the associated prescribed therapeutic rehabilitative/exercise regimenn is designed and configured for anyone who needs to gain range of motion of the shoulder, including stiff-painful shoulders that need to be forcefully, but at the individual's control, placed through a range of motion regimenn. For example, a frozen shoulder would normally benefit from this type of regimenn. In addition, those who need to protect the bony or soft tissue portions of the shoulder and who could be harmed by active range of motion exercises could also benefit. For example, in particular, a recently surgically repaired torn rotator

cuff tendon or a healing fracture would greatly benefit from this type of regimenn.

The prescribed therapeutic rehabilitation/exercise regimenn of the present invention may be done while sitting or standing. It is recommended to initiate the regimenn while sitting on a stool or armless chair with the patient's back to the door as shown in Figure 1. Then, the arm to be exercised is rested on the knee of the same side (left arm, left knee, as shown in Figure 1). Next, the ball handle 16 is placed under that hand, so that the rope 12 lies between the index and middle fingers where they join the hand. The next step in the regimenn provides that the other hand reach up and place the ball handle 16 under this hand in the same manner as described above. The present invention then provides that each passive range of motion exercise should be repeated about thirty times (thirty repetitions equal one set). The prescribed regimenn of the present invention then provides that each set should be repeated three times a day. It is important that the patient keep his/her back straight throughout the prescribed rehabilitation/exercise regimen so that the patient is moving only the shoulder and does not aggravate their back.

The prescribed therapeutic rehabilitation/exercise regimenn of the present invention provides, in most cases, for the injured arm to go for a "free ride" and is to remain limp at the injured shoulder. It is especially important to follow this prescribed procedure if the patient has recently suffered torn tendon, which were reattached to the bone. It is important that the patient's physician prescribe specific instructions concerning how far the patient should be allowed to move the shoulder.

The following prescribed therapeutic rehabilitation exercise range of motion regimenns of the present invention provide for the following examples. The instructions below are described as though it is the left shoulder being exercised pursuant to the present invention.

#### Flexion (Forward Elevation)

Starting position: The pulley 14 is located directly over the left shoulder, then the other ball handle 16 is pulled with the right hand (i.e., uninjured shoulder side). This action will raise the left arm straight out in front of the patient. Next, the patient should pull again with the right arm as hard as they are willing/able to pull. Then,



the patient should go as high as they can with the elevation of the left arm (letting pain be their guide), wherein the patient should expect to feel some level of discomfort. The patient should not exercise to the point of severe pain however. The patient should pace themselves so that they are able to complete the full thirty repetitions. The patient should complete this prescribed regimen of the present invention three times a day.

#### Abduction (Out to the Side)

Starting position: The pulley 14 is located one to two feet to the left of a patient. The patient should position both ball handles 16 under the fingers of both hands and should repeat the exercises as stated above for the flexion regimen except that the left arm of the patient will be elevating out to the left side this time. The patient should use the same guidelines as above for the flexion exercise regarding pain, discomfort and repetitions.

#### Internal Rotation

Starting position: It is recommended that the patient participate in these rehabilitative exercises while

standing. The pulley 14 is located directly overhead the patient both hands are on the exercise ball handles as stated above for flexion and abduction regimenns. The patient should place the left hand back around the right buttock. This procedure may be very difficult or impossible until the patient has increased their other range of motion of flexion and abduction. If the patient is unable to complete the internal rotation regimenn at this time, the patient should try again in a week. This time, the patient should pull down with the right hand using the same guidelines as stated above for internal rotation.

The portable and adaptable shoulder rehabilitation 10 of the present invention provides that the patient or other exercise user may be seated or standing during the exercises. The ball handles 16 are positioned so that the one ball used by the shoulder to be exercised starts out lower than the other ball handle 16 so that it can be reached easily. The hand of the shoulder to be exercised is placed over the lower ball handle 16 with the fingers straddling the rope 12. The other hand reaches up and grasps the other ball handle 16 in a similar manner. By pulling down with the normal or active arm, the injured arm is elevated passively. This procedure is very important

because it helps restore range of motion while protecting the soft tissue and bony structures about the injured shoulder.

The portable and adaptable shoulder rehabilitation kit apparatus 10 of the present invention provides in one embodiment for the use of large ball handles 16 in order to benefit individuals with hand disabilities such as arthritis, a disease which makes gripping a conventional handle or a conventional exercise grip difficult and often extremely painful. Therefore, the present invention provides in other embodiments for ball handles 16 of varying sizes in order to accommodate each individual's preference. The apparatus 10 also provides in one embodiment for portability, user-friendliness, lightweight compactness and ease of transportation so that the patient or individual exerciser can take the apparatus 10 with them and can exercise at any time regardless of the location. The apparatus 10 of the present invention also provides in one embodiment, that the pulley system 14 can be utilized by means other than an over the door hook 18 if a door is not available during utilization of the apparatus 10. This embodiment may include a nail, a screw in hook or the like or any other attaching means.

The preceding discussion is provided for example only. Other variations of the claimed inventive concepts will be obvious to those skilled in the art. Adaptation or incorporation of known alternative devices and materials, present and future is also contemplated. Although the invention has been described with reference to a specific embodiment, this description is not meant to be construed in a limiting sense. Various modifications of the disclosed embodiment as well as alternative embodiments of the invention will become apparent to one skilled in the art upon reference to the description of the invention. It is therefore contemplated that the appended claims will cover any such modifications of embodiments that fall within the true scope of the invention.